

# Compact Integrated DBR Laser Source for Absorption Lidar Instruments, Phase I

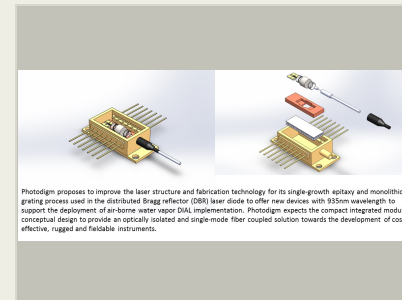
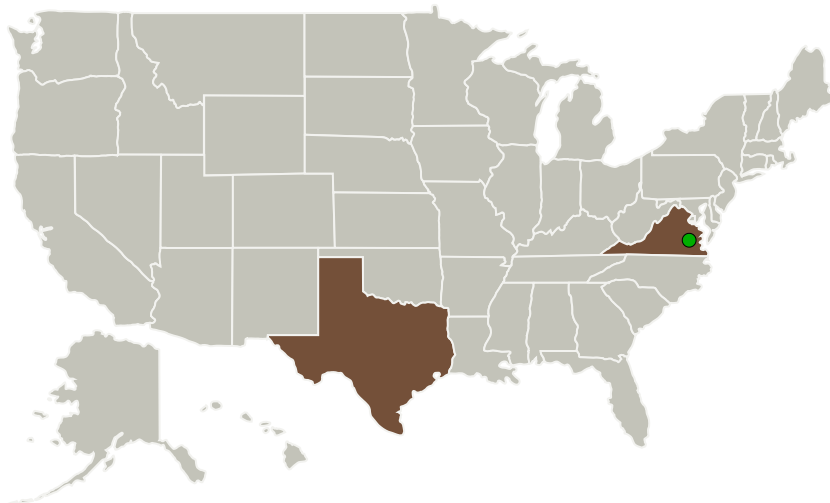
Completed Technology Project (2017 - 2017)



## Project Introduction

We propose to demonstrate a compact integrated laser module that addresses the requirements of the laser source in a water vapor differential absorption lidar (DIAL) system at the 935nm absorption wavelength. Our approach, with the development of the high performance DBR laser diode and the engineering of compact integration technology, will provide narrow linewidth and high power laser modules for numerous Lidar applications with the advantages of reduced size, weight and power (SWaP). Under this Phase I SBIR we propose to design and fabrication the EPI material and the DBR lasers with a high gain compressive-strained single quantum well (QW) structure, based on Photodigm's proprietary single growth epi, precision gain ridges, and monolithic grating process. We would develop an integrated module that is optically isolated and fiber coupled by investigating the custom build optical isolators of the operating wavelength and designing a compact, hermetic package to achieve high reliability and manufacturability. Continuing device engineering such as extended mode hop mounting, micro lens beam shaping and package space qualification are expected to be incorporated with this device family under Phase II of this SBIR program.

## Primary U.S. Work Locations and Key Partners



Compact Integrated DBR Laser Source for Absorption Lidar Instruments, Phase I Briefing Chart Image

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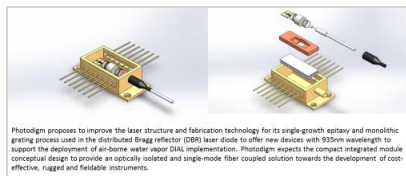
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Organizations Performing Work	Role	Type	Location
Photodigm, Inc.	Lead Organization	Industry	Richardson, Texas
● Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations	
Texas	Virginia

## Images



### Briefing Chart Image

Compact Integrated DBR Laser Source for Absorption Lidar Instruments, Phase I Briefing Chart Image  
(<https://techport.nasa.gov/image/135562>)

## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Organization:

Photodigm, Inc.

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

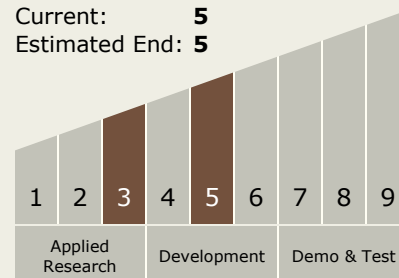
Carlos Torrez

### Principal Investigator:

Annie Xiang

## Technology Maturity (TRL)

Start: 3  
Current: 5  
Estimated End: 5



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## Technology Areas

### Primary:

- TX08 Sensors and Instruments
  - └ TX08.1 Remote Sensing Instruments/Sensors
    - └ TX08.1.5 Lasers